

We claim:

1. A prosthesis comprising:
a substantially rigid shell for attachment to skeletal structure, the shell including
a shell wall defining a shell receiving area and a terminal shell margin
defining a shell opening to the shell receiving area;
a resiliently yieldable liner for insertion in the shell receiving area, the liner
including a liner wall having a liner inner surface defining a liner
receiving area, the liner wall having a terminal liner margin defining a
restricted liner opening to the receiving area; and
a substantially rigid retainer ring attachable to the shell to engage the terminal
liner margin and inhibit deformation of the terminal liner margin.
2. The prosthesis according to claim 1 wherein the liner extends to envelop a
circumferential side apex of a femur ball.
3. The prosthesis according to claim 1 wherein the inner surface is substantially
spherical, and the liner extends to envelop greater than a hemisphere of a femur
ball.
4. The prosthesis according to claim 1 wherein the restricted liner opening has a
liner opening diameter smaller than a largest diameter of the liner receiving area.
5. The prosthesis according to claim 1 wherein the liner comprises a plurality of
expansion slits positioned adjacent the terminal liner margin and extending into
the liner whereby the restricted liner opening is enlargable and can be further
restricted.
6. The prosthesis according to claim 1 wherein the retainer ring includes a snapping
attachment mechanism attaching the retainer ring to the shell, and the snapping
attachment mechanism including a catch leg having a catch lip, and the shell
includes a catch ledge for engaging and holding the catch lip.

7. The prosthesis according to claim 6 wherein the catch leg includes a plurality of contraction slots dividing the catch leg.
8. The prosthesis according to claim 1 wherein the retainer ring includes an angled liner engagement surface, the liner includes an angled retainer ring engagement surface, and a liner engagement surface angle is less than a retainer ring engagement surface angle.
9. The prosthesis according to claim 8 wherein the liner engagement surface angle is approximately 168° , and the retainer ring engagement surface angle is approximately 170° .
10. The prosthesis according to claim 6 wherein the catch leg comprises an intermittent catch leg including spaced apart tabs, the protrusions are spaced apart to receive the tabs therebetween, and there are more recesses than protrusions.
11. The prosthesis according to claim 1 wherein the liner inner surface extends greater than 180° three dimensionally about a geometric center of the inner surface.
12. The prosthesis according to claim 1 wherein the liner includes a liner catch lip, and the shell includes a catch ledge for engaging and holding the liner catch lip.
13. The prosthesis according to claim 1 wherein the retainer ring comprises an attachment portion having the attachment mechanism thereon, a retainer portion engaging the terminal liner edge, and a connection between the attachment portion and the retainer portion.
14. The prosthesis according to claim 1 wherein the liner includes a positioning flange for engaging an upper surface of the terminal shell margin forming a relief gap between the shell and the liner.

17. A method for hip arthroplasty, the method comprising:
- attaching a shell to a patient's pelvis;
 - inserting a liner having an expandable portion into the shell;
 - positioning a retainer ring over the patient's femur and behind a ball of the femur;
 - expanding the expandable portion of the liner with the ball of the femur;
 - forcing the ball of the femur passed the expandable portion and into the liner;
 - attaching the retainer ring to the shell; and
 - engaging the expandable portion of the liner with the retainer ring to inhibit expansion of the expandable portion of the liner.
18. The method according to claim 17 wherein attaching the retainer ring comprises snapping the retainer ring to the shell, and expanding the expandable portion of the liner comprises elastically expanding the expandable portion of the liner.
19. The method according to claim 17 wherein positioning the retainer ring over the femur comprises positioning a retainer portion of the retainer ring over the femur, and attaching the retainer ring comprises attaching the attachment portion to the shell and connecting the retainer portion to the attachment portion.
20. The method according to claim 17 further comprising forming a relief gap between a base of the shell and a base of the liner.